

APPLICATION NOTE 3918

User's Guide for the MAX6877 Power-Supply Tracker/Sequencer

Abstract: This application note is a step-by-step User's Guide for designing with the MAX6877 voltage tracker and sequencer. The note explains how to make suitable component calculations.

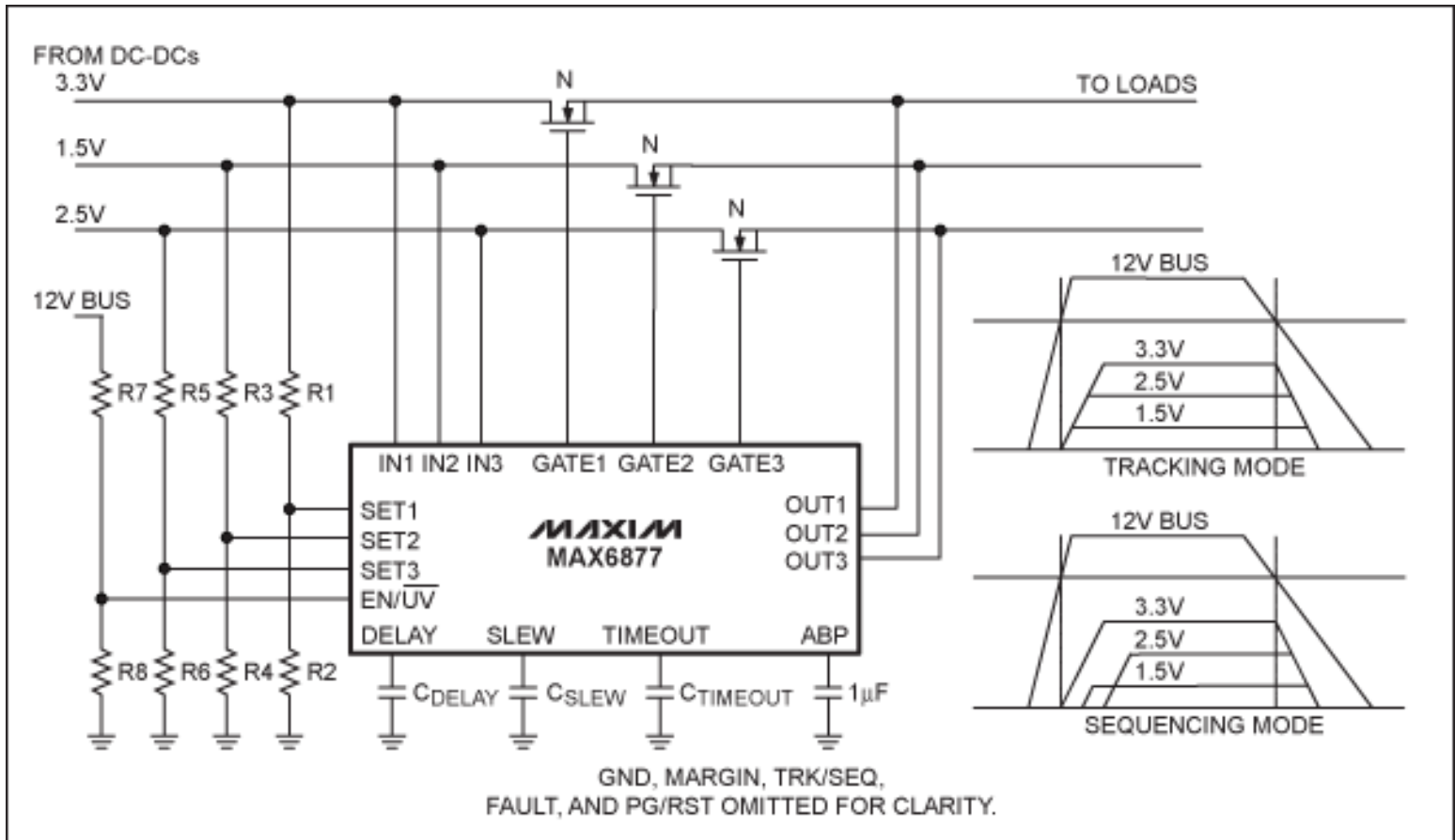


Figure 1. The basic circuit for the MAX6877.

MAX6877 Overview

- Tracks or sequences up to three voltages
- Closed-loop tracking control with programmable slew rate
- Program thresholds with resistors
- Program slew rate and timing delays with capacitors
- Fault output and power-good output

Description

The MAX6877 voltage tracker/sequencer can track or sequence up to three voltages. Use the TRACK/SEQ pin to select tracking or sequencing. The device will either track or sequence the three voltages, but it cannot track and sequence simultaneously. Power-up begins when EN/active-low UV is asserted and all three input voltages are above their thresholds. In the example circuit in **Figure 1**, EN/active-low UV is connected to the 12V bus, so the circuit will turn on when the bus exceeds its threshold and turn off when it falls under its threshold.

To create a basic design with the MAX6877, such as the one in Figure 1, follow these steps:

1. Select the input voltage thresholds for IN1, IN2, and IN3. The input voltages must exceed these thresholds for power-up to begin. Use the following formula to set the resistor-divider values for IN1. (For IN2 or IN3, replace R_1 with R_3 , or R_5 and R_2 with R_4 or R_6 .)

$$V_{\text{THRESH}} = 0.5 \times \left(1 + \frac{R_1}{R_2}\right)$$

2. Select the EN/active-low UV threshold using the following formula. EN/active-low UV can also be used as a logic-level input to control power up. If not used, connect EN/active-low UV to ABP.

$$V_{\text{THRESH}} = 1.286 \times \left(1 + \frac{R_7}{R_8}\right)$$

3. Set the voltage slew rate. (This is the rate at which the voltages at the outputs OUT1, OUT2, OUT3 ramp up and down.) Select capacitor C_{SLEW} by using the following formula:

$$SR = \frac{(9.35 \times 10^{-8})}{C_{\text{SLEW}}}$$

where C_{SLEW} is in farads, and SR is in V/s. C_{SLEW} must be in the range of $100\text{pF} < C_{\text{SLEW}} < 1\text{nF}$.

4. In sequencing-mode only, the voltages come up one after another, separated by a time delay which is set by capacitor C_{DELAY} using the following formula:

$$t_{\text{DELAY}} = 200\mu\text{s} + (500\text{k}\Omega \times C_{\text{DELAY}})$$

where C_{DELAY} is in farads, and t_{DELAY} is in seconds. t_{DELAY} is also the delay time from when all thresholds are exceeded to the start of sequencing or tracking. C_{DELAY} can be safely left out of the circuit, in which case t_{DELAY} becomes the default $200\mu\text{s}$.

5. Pick the MOSFETs for each channel. Ensure that the MAX6877 gate-drive circuit can drive the gate capacitance of the MOSFET.

Multiple MAX6877 parts can be connected together by connecting the power-good output of the first device to the enable input (EN/active-low UV) of the next device. For more information, see the data sheet.

Application Note 3918: www.maxim-ic.com/an3918

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